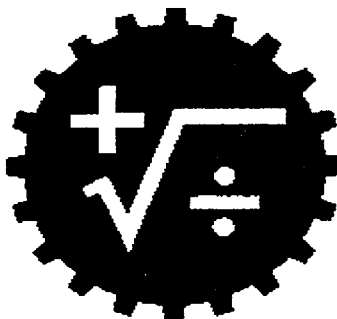


**Assessment Annotations  
for the Curriculum Frameworks**

# **Mathematics**

**Grades 4, 8, and 10**



---

Missouri Department of Elementary and Secondary Education  
Robert E. Bartman, Commissioner of Education

# **MATHEMATICS- ASSESSMENT ANNOTATIONS**

## **For The**

### **Mathematics Curriculum Frameworks**

The attached document provides supplemental assessment information to *Missouri's Framework for Curriculum Development in Mathematics K-12*. Contained within this assessment supplement are annotations that should be useful in understanding state and local responsibilities in assessing curriculum at the fourth, eighth, and tenth grade levels. This document indicates appropriate content and process specifications that should be useful in establishing curricula that prepares students to be proficient in mathematics.

Since the fourth and eighth grade benchmarks were established by the Framework's design, the column labeled, "What Students Should Know," establishes content that is appropriate for state testing. In addition, at the fourth, and eighth grade, the column labeled "What Students Should Be Able To Do" indicates appropriate processes for assessment. The last column labeled "Assessment Notes" further clarifies whether these processes are best assessed at the state or local level. If the phrase "Grade ( 4 or 8) state assessment" is shown then this indicates that this process may be tested on the state mathematics examination at the indicated grade level.

Because benchmarks were not explicitly indicated at the tenth grade, the assessment notes provide information for both the "To Know" and "To Do" columns. The assessment notes indicate whether the content and processes are appropriate for assessment at the tenth grade on the state examination. Under the "Know" and "Do" categories in the assessment notes column, if the notation "Grade 10 state assessment" is indicated then this identifies content and processes that may be assessed at the state level. Under the "Do" of the assessment notes, process items are classified on whether these are assessed at the state level or better assessed at the local level. The notation "Beyond 10<sup>th</sup> grade state assessment" indicates material that students may or may not have covered at this point and therefore is not tested at the state level.

All of the benchmarks that were identified by the notation, "Grade (4, 8, or 10) state assessment," will not necessarily appear on a state test in any given year. The number of test items developed to access mathematical content and processes may vary from year-to-year. Only Framework pages that required assessment notes are provided within this document which results in the skipping of some page numbers.

# IV. Connections

## What All Students Should Know

By the end of grade 4, all students should now

1. Problems may be looked at in more than one way.
2. Mathematics is used in other subject areas.
3. Mathematics is used in the real world.

## What All Students Should Be Able To Do

**NOTE:** Each item in this column is designed to address several elements of "what all students should be able to do."

By the end of grade 4, all students should be able to

- a. link concepts to student-generated procedures (NCTM Standard 4; MO 1.6, 1.10, 2.2)
- b. relate various representations of concepts or procedures to one another using a variety of methods, forms, and technologies (NCTM Standard 4; MO 1.6, 2.7)
- c. recognize relationships among different topics in mathematics (NCTM Standard 4; MO 1.6, 1.10)
- d. use mathematics in other curriculum areas and in daily living (NCTM Standard 4; MO 1.10, 4.7)

## Fourth Grade Assessment Notes

Do

- a. Local assessment
- b. Grade 4 state assessment, except technologies.
- c. Local assessment
- d. Local assessment

# IV. Connections

What All Students Should Know	What All Students Should Be Able To Do	Eighth Grade Assessment Notes
<p><i>By the end of grade 8, all students should know</i></p> <ol style="list-style-type: none"> <li>Problems may be looked at in more than one way.</li> <li>Mathematics is used in other subject areas.</li> <li>Mathematics is used in the real world.</li> </ol>	<p>NOTE: Each item in this column is designed to address several elements of "what all students should be able to do."</p> <p><i>By the end of grade 8, all students should be able to</i></p> <ol style="list-style-type: none"> <li>investigate problems utilizing graphical, numerical, physical, algebraic, and mathematical models or representations to understand and describe conclusions (NCTM Standard 4; MO 1.2, 1.6, 2.1, 3.7)</li> <li>apply mathematical reasoning and modeling to solve problems from other disciplines, such as art, music, psychology, science, and business (NCTM Standard 4; MO 1.2, 1.3, 3.2, 3.5)</li> <li>use technology such as scientific and graphing calculators, computers and models to demonstrate understanding of mathematical ideas (NCTM Standard 4; MO 1.4, 2.7)</li> <li>explore and investigate the importance of mathematics in their lives, future careers, and our ever-changing global society (NCTM Standard 4; MO 4.2, 4.3, 4.7, 4.8)</li> </ol>	<p>Do</p> <ol style="list-style-type: none"> <li>Grade 8 state assessment</li> <li>Local assessment</li> <li>Local assessment</li> <li>Local assessment</li> </ol>

# IV. Connections

## What All Students Should Know

*By the end of grade 12, all students should know*

- 1 Problems may be looked at in more than one way.
2. Mathematics is used in other subject areas.
3. Mathematics is used in the real world.

## What All Students Should Be Able To Do

NOTE: Each item in this column is designed to address several elements of "what all students should be able to do."

*By the end of grade 12, all students should be able to*

- a. recognize and/or derive equivalent representations for a concept (NCTM Standard 4; MO 1.6)
- b. analyze and relate procedures in multiple representations (NCTM Standard 4; MO 1.5, 3.6)
- c. relate and describe the connections within topics of mathematics and other disciplines (NCTM Standard 4; MO 1.6, 1.8, 1.10)
- d. investigate and determine the importance of mathematics in their lives, future careers, and our ever-changing global society (NCTM Standard 4; MO 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 4.8)
- e. evaluate the logic and aesthetics of mathematics as they relate to the universe (NCTM Standard 4; MO 1.10, 2.4)

## Tenth Grade Assessment Notes

**Know**

**Do**

- |                              |                              |
|------------------------------|------------------------------|
| 1 Grade 10 state assessment  | a. Grade 10 state assessment |
| 2. Grade 10 slate assessment | b. Grade 10 state assessment |
| 3. Grade 10 state assessment | c. Local assessment          |
|                              | d. Local assessment          |
|                              | e. Local assessment          |